



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2020-0915; Project Identifier AD-2020-00661-Q; Amendment 39-21501; AD 2021-08-07]

RIN 2120-AA64

Airworthiness Directives; Rockwell Collins, Inc., Global Positioning Systems

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain Rockwell Collins, Inc. (Rockwell Collins), GPS-4000S Global Positioning Systems (GPS) installed on airplanes. This AD was prompted by an un-annunciated GPS position error, which could cause a misleading localizer performance with vertical guidance (LPV) glidepath, resulting in controlled flight into terrain (CFIT). This AD requires upgrading the GPS-4000S. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Rockwell Collins, Inc., 400 Collins Road NE, Cedar Rapids, IA 52498; phone: (319) 295-5000; email: customersupport@rockwellcollins.com; website: www.rockwellcollins.com. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 901 Locust, Kansas City, MO 64106. For information on the availability of this material at the FAA, call (816) 329-4148.

Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0915; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for

Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Paul Rau, Aviation Safety Engineer, Wichita ACO Branch, FAA, 1801 Airport Road, Wichita, KS 67209; phone: (316) 946-4149; fax: (316) 946-4107; email: paul.rau@faa.gov or Wichita-COS@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to Rockwell Collins GPS-4000S GPS installed on airplanes. The NPRM published in the *Federal Register* on October 29, 2020 (85 FR 68501). The NPRM was prompted by the FAA being notified of a software error in GPS P/N 822-2189-100 that can result in an un-annunciated inaccurate GPS position in the region within approximately 1,000 miles (+/- 20 degrees) of 180 degrees west longitude. The software improperly applies the wide area augmentation system ionospheric delay corrections to the GPS signal from satellites located across the 180th meridian. Due to this anomaly, the position accuracy may be diminished such that the GPS-4000S P/N 822-2189-100 will not support LPV approaches in the affected region. In the NPRM, the FAA proposed to require removing P/N 822-2189-100 GPS-4000S GPS from the airplane and installing P/N 811-2189-101 GPS-4000S GPS. The FAA is issuing this AD to prevent a misleading glidepath on an affected LPV approach, resulting in CFIT.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from five commenters. The commenters were the Air Line Pilots Association, International (ALPA), Bombardier Aviation (Bombardier), Delta Air Lines, Inc. (Delta), Airbus Canada, and Transport Canada Civil Aviation (Transport Canada). The following presents the comments received on the NPRM and the FAA's response to each comment.

Supportive Comment

ALPA supported the AD without change.

Request Regarding the Unsafe Condition

Bombardier requested the FAA clarify paragraph (e) because it does not describe the unsafe condition accurately. Bombardier stated that the reference to a GPS vertical error is misleading and recommended rewording it to state that a GPS software anomaly causes an undetectable and inaccurate horizontal position from the Global Navigation Satellite System (GNSS).

The FAA disagrees. The software error in the GPS-4000 produces both horizontal and vertical position inaccuracies in the affected region. The FAA determined the vertical error results in an unsafe condition as it could cause the airplane to follow a glidepath below the obstacle clearance surface of the LPV approach.

Request Regarding Replacement of the GPS-4000S

Delta requested the FAA change the proposed requirement in paragraph (g)(1) to replace GPS-4000S P/N 822-2189-100 so that the AD does not prevent installation of a GPS P/N that is unaffected by the unsafe condition. Delta stated GPS-4000S P/N 822-2189-011 is two-way interchangeable with P/N 822-2189-100 as a set and is not affected by the unsafe condition. Delta also stated that Rockwell Collins could develop new GPS P/Ns that are not subject to the unsafe condition, which operators could not install without obtaining approval for an alternative method of compliance (AMOC), based on the proposed paragraph (g)(1). Delta requested the FAA change paragraph (g)(1) to require replacing GPS-4000S GPS P/N 822-2189-100 with “an improved part number.”

The FAA agrees. It is not necessary for the AD to require installing P/N 822-2189-101 because requiring the removal of P/N 822-2189-100 will resolve the unsafe condition. Operators may replace GPS P/N 822-2189-100 with any other system approved for installation in their aircraft, although the FAA expects installation of P/N 822-2189-101 will be the most common method.

The FAA has revised the AD to only require removing GPS-4000S GPS P/N 822-2189-100 from service without requiring replacement with a specific P/N GPS.

Requests Regarding Installation Prohibition

Airbus Canada and Transport Canada commented on the FAA’s proposal to prohibit the installation of the GPS-4000S GPS P/N 822-2189-100 as of the effective date

of the AD instead of once P/N 822-2189-101 has been installed. The commenters stated that this may create dispatch issues for operators depending on the number of available parts.

The FAA agrees and has changed the prohibition of installation to take effect 24 months after the effective date of the AD. Operators may install a GPS-4000S GPS P/N 822-2189-100 to address maintenance/repair issues prior to complying with the AD. Once an operator has removed GPS-4000S GPS P/N 822-2189-100 to comply with the AD, the operator must maintain that configuration and may not change it to install a GPS-4000S GPS P/N 822-2189-100 without an approved AMOC.

Request Regarding Applicability

Delta requested the FAA change the applicability to specify only those aircraft types with the affected software installed. Delta stated that as proposed, the AD would require all operators to review records to verify whether the affected GPS P/N is installed on all of their airplane fleets, regardless of whether it is type certificated or supplemental type certificated.

The FAA disagrees. The FAA issues an AD against an appliance when, as in this case, the unsafe condition exists in the appliance. If known, the FAA will list the aircraft models that the appliance might be installed on. However, this would not be an all-inclusive list and would still require all operators to check their airplanes for the affected appliance, regardless of whether the model of their airplane is listed.

The FAA did not change this AD based on this comment.

Requests Regarding Reinstatement of LPV Approaches

Airbus Canada stated that the NPRM does not mention that Rockwell Collins removed the LPV approaches from the impacted airports. Airbus Canada requested that the AD provide credit for this. Transport Canada asked whether Rockwell Collins and the FAA will return the affected Alaska LPV procedures to the Navigation database for customers who have updated their entire fleet with the P/N 822-2189-101 version of the GPS-4000S.

The FAA disagrees with this comment. The FAA infers that the commenters are referencing Rockwell Collins' removal of the affected LPV approaches from the

Rockwell Collins Navigation database beginning in February 2020. This LPV approach removal was initiated by Rockwell Collins as a temporary mitigation, but it affects all versions of the GPS-4000S that use the database, including those (such as the -101 version) that do not have the unsafe condition. Accordingly, the FAA did not base its determination and the corrective actions of this AD on the removal of affected LPV approaches.

The FAA did not change this AD based on this comment.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for the changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information

The FAA reviewed Rockwell Collins Service Information Letter GPS-4X00()-19-3, Revision No. 2, dated March 25, 2020. The service letter describes the unsafe condition and provides operating limitations for approaches to airports in the affected region until the software is upgraded.

The FAA also reviewed Rockwell Collins Service Bulletin GPS-4X00()-34-510, Revision No. 1, dated March 6, 2020. The service bulletin specifies procedures for upgrading the GPS-4000S software, which removes P/N 822-2189-100 and installs P/N 822-2189-101.

Costs of Compliance

The FAA estimates that this AD affects 3,500 airplanes of U.S. registry. The FAA estimates that 2,000 airplanes have two GPS-4000S units installed and 1,500 airplanes have one GPS-4000S unit installed.

The FAA estimates the following costs to comply with this AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Replace GPS-4000S (airplanes with 2 units installed)	7 work-hours x \$85 per hour = \$595	\$4,540.00	\$5,135	\$10,270,000
Replace GPS-4000S (airplanes with single unit installed)	3.50 work-hours x \$85 per hour = \$297.50	\$2,270	\$2,567.50	\$3,851,250

The FAA has included all known costs in this cost estimate. According to the manufacturer, however, some of the costs of this AD may be covered under warranty, thereby reducing the cost impact on affected operators.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2021-08-07 Rockwell Collins, Inc.: Amendment 39-21501; Docket No. FAA-2020-0915; Project Identifier AD-2020-00661-Q.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to Rockwell Collins, Inc. GPS-4000S Global Positioning System (GPS) part number (P/N) 822-2189-100 installed on airplanes, certificated in any category.

(d) Subject

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 3400, NAVIGATION SYSTEM.

(e) Unsafe Condition

This AD was prompted by an un-annunciated GPS vertical error that could result

in a hazardously misleading localizer performance vertical (LPV) glidepath. The FAA is issuing this AD to prevent a misleading GPS position on an LPV approach. The unsafe condition, if not addressed, could result in a misleading GPS position on an LPV approach resulting in controlled flight into terrain.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Actions

(1) Within 24 months replace each GPS-4000S GPS P/N 822-2189-100 with a GPS that does not have P/N 822-2189-100.

(2) As of 24 months after the effective date of this AD, do not install GPS-4000S GPS P/N 822-2189-100 on any airplane.

(h) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Wichita ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in Related Information.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(i) Related Information

(1) For more information about this AD, contact Paul Rau, Aviation Safety Engineer, Wichita ACO Branch, FAA, 1801 Airport Road, Wichita, KS 67209; phone: (316) 946-4149; fax: (316) 946-4107; email: paul.rau@faa.gov or Wichita-COS@faa.gov.

(2) Rockwell Collins Service Information Letter GPS-4X00()-19-3, Revision No. 2, dated March 25, 2020; and Rockwell Collins Service Bulletin GPS-4X00()-34-510, Revision No. 1, dated March 6, 2020, contain information related to this AD. For this service information, you may contact Rockwell Collins, Inc., at 400 Collins Road NE,

Cedar Rapids, IA, 52498; phone: (319) 295-5000; email:
customersupport@rockwellcollins.com; website: www.rockwellcollins.com.

Issued on March 30, 2021.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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